

By the Creators of EV3Lessons





# INTRODUCTION A MICROPYTHON

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#### **OBJECTIFS DE LA LEÇON**

Apprenez à utiliser MicroPython REPL sur SPIKE Prime

Pour créer des programmes complets VS. Code à exécuter sur le hub, suivez les instructions à l'adresse <u>https://github.com/sanjayseshan/spikeprime-vscode/wiki</u>

### ÉTAPE I : SE CONNECTER (WINDOWS)

- Installez l'émulateur de terminal de votre choix
- Exemple : PuTTY <u>https://www.putty.org/</u>
- Assurez-vous que votre logiciel SPIKE Prime ne fonctionne pas
- Connectez le Hub à votre ordinateur via le port USB
- Trouvez le port
  - Sur un PC, regardez dans votre gestionnaire de périphériques (dans le menu Démarrer Outils administratifs de Windows Gestionnaire de périphériques) sous série pour voir quels ports série vous avez connectés
  - Si vous avez plusieurs ports série USB, essayez de vous déconnecter et de vous reconnecter pour voir lequel apparaît
- Connectez-vous au port de droite à 115200 bauds





#### ÉTAPE I : SE CONNECTER (DEBIAN GNU/LINUX)

- 1. Ouvrez le terminal Vous pouvez le trouver habituellement sous Applications  $\rightarrow$  System Tools
- 2. Tapez les commandes suivantes (pour Debian et ses dérivés) :
  - 1. sudo apt-get update
  - 2. sudo apt-get install -y screen
- 3. Branchez votre Hub et lancez sudo dmesg. Une longue liste de messages de log s'affichera. La dernière ligne (ou presque) doit contenir le périphérique USB ACM et l'identifiant similaire à ttyACMO. Si vous ne le trouvez pas, cherchez d'abord LEGO Technic Large Hub.
- Lancez l'écran sudo /dev/ttyACM0 115200.
   Remplacez ttyACM0 par votre identifiant

File Edit View Search Terminal Help 154870.922611] ath: country maps to regdmn code: 0x3a 154870.922611] ath: Country alpha2 being used: US 154870.922612] ath: Regpair used: 0x3a 154870.922613] ath: regdomain 0x8348 dynamically updated by country element 154870.922613] ath: regdomain 0x8348 dynamically updated by country element 154870.924227] IPv6: ADDRCONF(NETDEV_CHANGE): wlp107s0: link becomes ready 154870.975985] wlp107s0: Limiting TX power to 30 (30 - 0) dBm as advertised by 4:a2:22:b6:8a:08 155669.737060] pcieport 0000:00:1c.4: AER: Corrected error received: 0000:00:1c 4 155669.737086] pcieport 0000:00:1c.4: PCIe Bus Error: severity=Corrected, type= ata Link Layer, (Transmitter ID) 155669.737086] pcieport 0000:00:1c.4: [12] Timeout 155669.737088] pcieport 0000:00:1c.4: [12] Timeout
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155964.307652] usb 1-7: New USB device found, idVendor=0694, idProduct=0009, bc
Device= 2.00
155964.307664] usb 1-7: New USB device strings: Mfr=1, Product=2, SerialNumber=
155964.307668] usb 1-7: Product: LEGO Technic Large Hub in FS Mode
155964.307672] usb 1-7: Manufacturer: LEGO System A/S
155964.307676 435 1 7. 50 14 (14) (15) 50 50 50 50 50 50 50 50 50 50 50 50 50
155964.30969, cdc_acm 1-7:1.0: ttyACMO: USB ACM device

### ÉTAPE I : SE CONNECTER (MAC OS X)

- I. Ouvrez le terminal Vous pouvez le trouver habituellement sous Applications  $\rightarrow$  Utilities
- 2. Exécutez ls /dev/ | fgrep usb | fgrep tty pour trouver le port du hub
- 3. Exécutez l'écran /dev/tty.usbmode366A398231381 115200. Remplacez tty... par la sortie de la première commande. S'il y avait plusieurs sorties, essayez-les toutes jusqu'à ce que vous obteniez la bonne.

Vous trouverez ci-dessous un exemple de commandes en cours d'exécution. La sortie de l'ordinateur est en vert, les commandes que vous tapez sont en noir.

```
$ ls /dev | fgrep usb | fgrep tty
```

```
tty.usbmodem366A39831234
```

```
$ screen /dev/tty.usbmodem366A39831234
```

### ÉTAPE 2

- Vous pouvez voir défiler beaucoup de chiffres. C'est le journal des capteurs et des moteurs.
- Hit Control-C
- Vous serez prêt à programmer

B COM18 - PuTTY		—		×	
0, 165, 0]], [49, [0, 0, -141, 0]], [61, [70, 10]], [-38,	31, 100	1], [	0, 4,	1],	^
{"m":0,"p":[[49, [0, 2, 14, 0]], [61, [75, 10]], [48, [0,	0, -82,	0]],	[48,	[0,	
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{"m":0,"p":[[49, [0, 2, 14, 0]], [61, [75, 10]], [48, [0,	0, -82,	0]],	[48,	[0,	
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0, 165, 0]], [49, [0, 0, -141, 0]], [61, [69, 10]], [-43, 38, 995], [0, 4, 2], [ MicroPython vl.9.4-1146-gca9944357 on 2019-10-03; LEGO Technic Large Hub with ST M32F413xx Type "help()" for more information.

#### **MODULE HUB**

- Le module python "Hub" contient toutes les fonctions/objets clés qui sont nécessaires pour interagir avec le Hub SPIKE Prime.
- Pour accéder à ce module, vous devez d'abord "importer" le module. Tapez "import hub" à l'invite MicroPython



Une fois que vous avez importé le hub, vous pouvez explorer certaines des interfaces qu'il expose en utilisant l'auto-completion. Tapez "Hub". (assurez-vous d'inclure la période) et appuyez ensuite sur le bouton "Tab"

>>> hub.			
class	name	version	BT_VCP
Image	USB_VCP	battery	ble
bluetooth	button	display	info
led	motion	port	power_off
sound	status	supervision	temperature

#### COMMANDE D'AIDE

Le MicroPython sur brique fournit également un outil d'aide limité. Pour accéder à l'aide, tapez "help()"

```
>>> help()
Welcome to MicroPython!
For online help please visit http://micropython.org/help/.
Quick overview of commands for the board:
 hub.info() -- print some general information
 hub.status() -- print sensor data
Control commands:
                -- on a blank line, enter raw REPL mode
  CTRL-A
                -- on a blank line, enter normal REPL mode
  CTRL-B
 CTRL-C
                -- interrupt a running program
                -- on a blank line, do a soft reset of the board
 CTRL-D
                -- on a blank line, enter paste mode
  CTRL-E
For further help on a specific object, type help(obj)
For a list of available modules, type help('modules')
```

#### **AUTRES MODULES/BIBLIOTHÈQUES**

Tapez la commande help(`modules`) (assurez-vous de taper les cotations)

>>> help('modules	; <b>*</b> )		
main	heapq	struct	umachine
_onewire	hub	sys	uos
array	io	time	urandom
binascii	json	ubinascii	ure
builtins	machine	ucollections	uselect
cmath	math	uctypes	ustruct
collections	micropython	uerrno	utime
errno	OS	uhashlib	utimeq
firmware	random	uheapq	uzlib
gc	re	uio	zlib
hashlib	select	ujson	
Plus any modules on the filesystem			

Vous trouverez ici une liste des modules disponibles sur le site SPIKE Prime

#### **AUTRES MODULES/BIBLIOTHÈQUES**

Vous pouvez utiliser la commande d'importation pour charger n'importe quelle bibliothèque que vous trouvez et ensuite utiliser l'autocompletion ou help() pour explorer leurs fonctions

```
>>> import random
>>> help(random)
object <module 'urandom'> is of type module
___name__ -- urandom
getrandbits -- <function>
seed -- <function>
randrange -- <function>
randint -- <function>
choice -- <function>
uniform -- <function>
wniform -- <function>
>>> random.random()
0.711182
>>> random.random()
0.408947
```

### DÉFII: BONJOUR LE MONDE

Imprimez "Hello World" sur votre matrice de lumière

#### Quelques étapes clés :

- I. Importez le module Hub
- 2. Explorez les composants du Hub pour en trouver un qui contrôle la matrice de lumière (indice : vous voulez "afficher" quelque chose)
- 3. Enfin, cherchez une méthode qui "montre" quelque chose sur l'écran

### DÉFII: BONJOUR LE MONDE

Imprimez "Hello World" sur votre matrice de lumière

>>> import hub			
class	name	version	BT_VCP
Image	USB_VCP	battery	ble
bluetooth	button	display	info
led	motion	port	power_off
sound	status	supervision	temperature
>>> hub.display			
class	callback	clear	pixel
rotation	show		
>>> hub.display.show('Hello World')			

## GÉNÉRIQUE

- Cette leçon a été créée par Sanjay Seshan et Arvind Seshan pour « SPIKE Prime Lessons »
- D'autres leçons sont disponibles à l'adresse suivante <u>www.primelessons.org</u>



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